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2013
Autonomous Flow-Through (AFT) CO2 data of the West Florida Shelf
vector digital data

Data Series
883

St. Petersburg, Fl
U.S. Geological Survey - St. Petersburg Coastal and Marine Science Center

http://dx.doi.org/10.3133/ds883

The United States Geological Survey (USGS) is conducting a study on the effects of climate change on ocean acidification within the Gulf of Mexico, dealing specifically with the effect of ocean acidification on marine organisms and habitats. To investigate this, the USGS participated in cruises on the West Florida Shelf and northern Gulf of Mexico regions aboard the R/V Weatherbird II, a ship of opportunity led by Kendra Daly, of the University of South Florida (USF). Cruises left from and returned to Saint Petersburg, Florida, but followed different routes (see Trackline). The USGS collected data pertaining to pH, dissolved inorganic carbon (DIC), and total alkalinity in discrete samples. Discrete surface samples were taken hourly while in transit during cruises. Along with the surface samples, another set of discrete samples were taken at various depths at stations. In addition to the discrete samples, flow-through data was collected on cruises in a variety of forms. Surface CTD data were collected every five minutes and included temperature, salinity, and pH. Two additional flow-through instruments were setup to record pH and CO2 every 15 minutes. Vertical CTD profiles were collected by USF, using the following sensors: CTD, oxygen, chlorophyll fluorescence, optical backscatter, and transmissometer, corroborating USGS data. Additionally, discrete depth samples for nutrients, chlorophyll, and particulate organic carbon/nitrogen were collected.
Discrete water samples were collected underway to corroborate the continuous partial pressure of carbon dioxide (pCO2) measurements. Water samples were analyzed for salinity, pH, and total alkalinity at the USGS geochemistry laboratory in St. Petersburg, Florida. These continuous flow-through data are used to corroborate the discrete sample data using CO2SYS.
The USGS Saint Petersburg Coastal and Marine Science Center (SPCMSC) - St. Petersburg, Fla., assigns a unique identifier to each cruise or field activity. For example, 12BHM01 indicates the data were collected in 2012 for Benthic Habitat Mapping and the data were collected during the first field activity for that project in that calendar year. Refer to http://walrus.wr.usgs.gov/infobank/programs/html/definition/activity.html for a detailed description of the method used to assign the cruise ID. This publication contains data for each of the five benthic habitat cruises conducted aboard the Research Vessels (R/V) Weatherbird II and Bellows in 2012: 12BHM01 February 15-24 (Weatherbird II), 12BHM02 April 24 - 29 (Bellows), 12BHM03 May 8 - 17 (Weatherbird II), 12BHM04 June 29 - July 1 (Bellows) and 12BHM05 August 2 - 12 (Weatherbird II).

2012

data collection

Complete
None planned

-89.0000
-82.5000
30.5000
27.0000

Ocean Chemistry
pH
total carbon
Salinity
carbon flux
Ocean Acidification
pCO2
Temperature

Region
West Florida Shelf
Florida
United States

None
Mesopelagic
Epipelagic
ocean surface
Bathypelagic

None
2012

None
USGS and USF request to be acknowledged as originators of the data in future products or derivative research.

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Microsoft Windows 7 Version 6.1 (Build 7600) ; ESRI ArcGIS 10.0.4.4000 ; Microsoft Excel

These data were collected in the field and have not been checked for internal consistencies.
These data were collected along tracklines (2-D) and are therefore inherently incomplete. No data were collected between tracklines.

Flow-through data were collected with a Sunburst AFT pH, which measures pH on the total hydrogen ion scale and was attached to the flow-through system. This system sampled the seawater every three minutes with a precision and accuracy of 0.001 and ±0.003, respectively. The Sunburst AFT-CO2 system was used to measure the partial pressure of CO2 in water (pCO2) and was attached to the shipboard flow-through system. The instrument sampled every five minutes with a precision and accuracy of 1 ppm and ± 3 ppm, respectively.
2012

Data were entered into a spreadsheet and merged with other data sources: GPS from the ship and the lab results of total alkalinity and dissolved inorganic carbon from the USGS St. Petersburg Carbon Analytical Laboratory.
2012
2012_<Month>__AFT_CO2.csv
2012_<Month>__AFT_CO2.xls

The spreadsheet was imported into ArcGIS 10 and converted into a shapefile.
2012_<Month>__AFT_CO2.xls
2012

8.9831528411952133e-009
8.9831528411952133e-009
Decimal degrees

D WGS 1984
WGS 1984
6378137.0
298.257223563

2012_<Month>_AFT_CO2
Autonomous Flow Through (AFT) system continuous measurements of chemical and physical parameters of seawater
USGS

FID*
Internal feature number.
ESRI

Sequential, unique whole numbers that are automatically generated.

Shape*
Feature geometry.

ESRI

Coordinates defining the features.

Cruise_ID
Cruise name according to the USGS Field Activity Collection
USGS

12BHM01, 12BHM02, 12BHM03, 12BHM04, 12BHM05

Date_UTC
Date in UTC time zone; MM/DD/YYYY
USGS

Date of sample collection in MM/DD/YYYY format

20120215
20120812

Time_UTC
Time of data collection in HH:MM UTC, 24 hour format
USGS

Time of data collection in HH:MM UTC

Date_EDT
Date in EDT time zone; MM/DD/YYYY
USGS

Date of sample collection in MM/DD/YYYY format

20120215
20120812

Time_EDT
Time of data collection in HH:MM EDT, 24 hour format
USGS

Time of data collection in HH:MM EDT

Latitude
Latitude in decimal degrees
USGS

Longitude
Longitude in decimal degrees
USGS

CO2
a measure of CO2 content of a solution
USGS

Temp_C
water temperature
USGS

Ship_Sal_PSU
Salinity in Practical Salinity Units
USGS

All attributes are common between the three data formats provided (.csv, .xls, .shp), except for the attributes FID and SHAPE (indicated by *), which are found only within the shapefile (.shp) because they are unique to that data type. Additionally, the GPS data were taken from either the R/V Weatherbird II's or Bellow's navigation logs and matched with the time logs on the sonde. These data were not QA/QC checked and could have data errors due to tubes clogging or from flow-through shutdown due to inclement weather.
Robbins, L.L., Knorr, P.O., Barrera, K. E., Daly, K.L., 2012, USGS Field Activities 12BHM01, 12BHM02, 12BHM03, 12BHM04 and 12BHM05 on the West Florida Shelf, Gulf of Mexico, in February, April, May, June and August 2012: U.S. Geological Survey Data Series 883, available online at http://dx.doi.org/10.3133/ds883.

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Microsoft Excel (.xls); Comma-delimited text file (.csv); ArcGIS (.SHP)
ZIP file format

http://dx.doi.org/10.3133/ds883

Free

20130610

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FGDC Content Standard for Digital Geospatial Metadata
FGDC-STD-001-1998